

# A PRELIMINARY LIST OF MOSSES FROM THE THREE KINGS ISLANDS, NORTHERN NEW ZEALAND

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*Abstract.* A preliminary list of 36 mosses from the Three Kings Islands is provided, based mainly on collections held in the herbarium of the Auckland Institute and Museum. The species recorded are all known members of northern New Zealand coastal communities. Comparison with moss floras of other northern offshore islands indicates that further bryological exploration of the Three Kings would be expected to reveal a much richer moss flora than is at present recorded.

Although no bryologist has yet visited the Three Kings Islands collections of mosses have been made there by a number of scientists. A few of these specimens have become the basis of published records, the most substantial being six species of moss which were recorded as substrates in a zoological study of Tardigrada (Horning *et al* 1978). Three species of terrestrial moss were included by Turbott (1948) in his account of vegetation quadrats established on Great Island. Most specimens, however, remain in herbaria as unpublished records.

In this paper an attempt is made to gather together information from the existing Three Kings moss collections. Retrieval of specimens I believe to be complete, as at September 1985, from the herbarium of the Auckland Institute and Museum (AK), with 78 packets of Three Kings mosses, and from the herbarium of the Department of Botany, University of Auckland (AKU), with 19 packets. In addition, some specimens, a number of which are duplicates of the AK holdings, have been located in the herbarium of Botany Division of DSIR (CHR), 19 packets, and of the National Museum of New Zealand (WELT), 2 packets. The collectors of these specimens, with dates of collection given in brackets, are: G.T.S. Baylis (December 1945, January 1951); E.G. Turbott (April-May 1946); M. Holdsworth (January 1951); G.W. Ramsay (November 1970); E.K. Cameron (November-December 1983); B.W. Hayward (November-December 1983) and A.E. Wright (November-December 1983)

For each species listed, records are given for individual islands within the Three Kings Group, together with the total number of collections examined by me. The specimen number of a selected voucher is given, as well as a summary of the habitat data given by collectors. Where the record is believed to be the northernmost for the species in the New Zealand Botanical Region this is indicated.

## ANNOTATED LIST OF MOSSES OF THE THREE KINGS ISLANDS

*Achrophyllum dentatum* (Hook. f. & Wils.) Vitt & Crosby  
*syn. Pterygophyllum dentatum* (Hook. f. & Wils.) Mitt.  
 Great I; 2 collections; AK 26690; Tasman Stream.

*Bryum billardieri* Schwaegr. var. *platyloma* Mohamed  
*syn. B. truncorum* Brid.  
 Great I; 5 collections; AK 22001; under kanuka in Tasman Valley and on soil in  
 Castaway Valley; northernmost record.

*Bryum campylothecium* Tayl.  
 Great I, North East I, West I; 4 collections; AKU 67902; terrestrial on rocks;  
 northernmost record.

*Bryum dichotomum* Hedw.  
 Great I, South West I; 2 collections; AKU 67891; terrestrial in more or less  
 exposed sites.

*Camptochaete pulvinata* (Hook. f. & Wils.) Jaeg.  
 Great I; 2 collections; AK 26706; Castaway Stream; northernmost record.

*Campylopus bicolor* (C. Muell.) Wils.  
 Great I; 1 collection, verified by J.-P. Frahm; AK 22644; northernmost record.

*Campylopus clavatus* (R. Br.) Wils.  
 Great I; 1 collection; CHR 164575; on clay slope at edge of pohutukawa forest  
 remnant.

*Campylopus introflexus* (Hedw.) Brid.  
 Great I; 5 + ?2 collections; AK22000; on rocks, in clearing; recorded also by  
 Turbott (1948).

*Campylopus pyriformis* (K.F. Schultz) Brid.  
*syn. C. torquatus* Mitt.  
 Great I; 1 collection; CHR 406275; among kanuka and *Coprosma rhamnoides*.

*Dicranella clathratum* Hook. f. & Wils.  
 Great I; 1 collection; AK 169408; with *Fissidens asplenioides* Tasman Valley  
 Stream; northernmost record.

*Distichophyllum pulchellum* (Hampe) Mitt.  
 Great I; 6 collections; AK 26699; Castaway and Tasman Valley Streams;  
 northernmost record.

*Eriopus cristatus* (Hedw.) Brid.

Great I; 2 collections; AKU 67930; on rocky stream bank; northernmost record.

*Fissidens asplenioides* Hedw.

Great I; 1 collection; AK 169407; with *Dicranella clathratum*, Tasman Valley Stream.

*Fissidens leptocladus* C. Muell. & Rodw.

Great I; 1 collection; AK 26692; Tasman Valley Stream.

*Homalia pulchella* Hook. f. & Wils.

Great I; 2 collections; AK 170070; with *Racopilum strumiferum*, Tasman Stream; northernmost record.

*Hypnodendron spininervium* (Hook.) Jaeg.

Great I; 8 + ?1 collections; AK 168765; on rocky bank, margin of Tasman Valley Stream; northernmost record.

*Hypnum chrysogaster* C. Muell.

Great I; 1 collection; AK 26732; on earth, Tasman Valley; northernmost record.

*Hypnum cupressiforme* Hedw.

Great I; 5 collections; AKU 67928; terrestrial, under low kanuka, and on cliff by the *Pennantia baylisiana*; northernmost record.

*Isopterygium* cf. *minutirameum* (C. Muell.) Jaeg.

Great I; 2 collections; AK 26694, verified by Z. Iwatsuki; Castaway Stream, and among kanuka and *Coprosma rhamnoides* in north-east area of the island.

*Leptodontium interruptum* (Mitt.) Broth.

Great I; 7 collections; AK 22646; on earth and rocks, among stunted kanuka; recorded also by Turbott (1948); northernmost record.

*Macromitrium gracile* (Hook.) Schwaegr.

Great I; 1 collection; personal herbarium J.K. Bartlett, in AK; epiphytic on the fern *Davallia tasmanii*; this specimen is the basis of the record by Vitt (1983); northernmost record.

*Macromitrium brevicaule* (Besch.) Broth.

syn. *M. watsii* Broth.

syn. *M. subfragile* Dix. & Sainsb.

Great Island; 2 collections; AKU 67908; epiphytic on *Cordyline kaspar*; recorded also by Vitt (1983); northernmost record.

*Philonotis tenuis* (Tayl.) Reichdt.

West I; 3 collections; AKU 67901 propaguliferous form; rock crevice in seepage.

*Pohlia nutans* (Hedw.) Lindb.

Great I; 1 collection; AK 22647; northernmost record.

*Ptychomnion aciculare* (Brid.) Mitt.

Great I; 6 collections; AK 26688; terrestrial under kanuka, Summit Ridge and upper Tasman Valley; northernmost record.

*Racopilum convolutaceum* (C. Muell.) Reichdt.

syn. *Rhacopilum strumiferum* C. Muell.

Great I, South West I; 6 collections; AKU 67900; Tasman Stream, and on steep bank in the open on South West Island.

*Rhynchostegiella muriculata* (Hook. f. & Wils.) Broth.

syn. *Eurhynchium muriculatum* (Hook. f. & Wils.) Jaeg.

North East I, South West I; 2 collections; AKU 67898; on rotten logs in forest; northernmost record.

*Rhynchostegium laxatum* (Mitt.) Par.

Great I; 1 + ?2 collections; AKU 67923; terrestrial, on rock under kanuka; northernmost record.

*Rhynchostegium tenuifolium* (Hedw.) Reichdt.

Great I, North East I, South West I; 4 + ?3 collections; AK 168746; terrestrial, under low kanuka.

*Sematophyllum amoenum* (Hedw.) Mitt.

Great I, North East I; 4 collections; AK 168748; on decaying log and epiphytic on kanuka; northernmost record.

*Sematophyllum contiguum* (Mitt.) Mitt. in Seeman

Great I; 4 collections; AK 26735; on rocks and epiphytic on *Cordyline kaspar*.

*Sematophyllum homomallum* (Hampe) Broth.

North East I; 1 collection; AKU 67886; on rocks and epiphytic on kanuka; northernmost record.

*Thuidium furfurosum* (Hook. f. & Wils.) Reichdt.

Great I; 13 collections; AKU 67925; apparently common, on ground under kanuka and manuka; recorded also by Turbott (1948).

*Thuidium sparsum* (Hook. f. & Wils.) Jaeg.

syn. *T. furfurosum* (Hook. f. & Wils.) Reichdt. var *sparsum* (Hook. f. & Wils.) Sainsb.

Great I; 1 collection; AK 26711; Tasman Stream.

*Tortula papillosa* Wils.

North East I, South West I; 3 collections; AKU 67896; on exposed rock; northernmost record.

*Trichostomum brachydontium* Bruch

Great I; I collection; CHR 164571; on clay at edge of pohutukawa forest remnant; northernmost record.

*Excluded records**Brachythecium rutabulum* (Hedw.) B.S.G.

Recorded by Horning *et al* (1978) on the basis of a specimen *leg.* G.W. Ramsay No.498, *det.* K.W. Allison. Examination of a duplicate in CHR (CHR 276579) reveals that this non-fruiting material is almost certainly *Rhynchostegium tenuifolium* (Hedw.) Jaeg.

*Bryum truncorum* (Brid.) Brid.

Recorded by Horning *et al* (1978) on the basis of several specimens *leg.* G.W. Ramsay. Following revision this species is now recognised in New Zealand as *Bryum billardieri* Schwaegr. (Ochi 1971). One specimen cited by Horning *et al*, No.497, is misidentified *Bryum campylothecium*.

*Isopterygium albescens* (Hook.) Jaeg.

*syn.* *I. molliculum* (Sull.) Mitt.

Recorded by Sainsbury (1955) from the Three Kings Islands. The specimen in Sainsbury's herbarium (WELT M7897) together with two specimens in AK, AK 26693 and AK 26694, together with a fourth specimen in CHR (Herb. K.W. Allison No. 4124) would appear to be all part of a single gathering by M. Holdsworth *s.n.* 15.i.1951 at Castaway Stream, Great I. The only other Three Kings specimen of *Isopterygium* that I located, *leg.* G.W. Ramsay 475, CHR 164551 is identified by K.W. Allison as *I. albescens* (Hook.) Jaeg. Both these collections have been determined by Z. Iwatsuki as *I. cf. minutirameum* (C. Muell.) Jaeg. *I. minutirameum* is an Asiatic species known from a number of localities in northern New Zealand.

*Weisia controversa* Hedw.

Recorded by Horning *et al* (1978) on the basis of a specimen *leg.* G.W. Ramsay No. 490, *det.* K.W. Allison. A duplicate in CHR (CHR 164571) is misidentified *Trichostomum brachydontium* Bruch.

*Discussion*

All moss species recorded here for the Three Kings Is are already known from the northern New Zealand mainland in coastal, and in some cases also from inland, habitats. Fourteen of the species have been recorded from the Kermadec Is, 1200 km to the north-east (Sykes 1977). For the other 22 species these Three Kings records are the northernmost in the New Zealand Botanical Region, *sensu* Allan (1961). Further bryological collection on the Kermadec Islands will no doubt reduce this number.

The species recorded reflect a diversity of habitats, both moist, such as stream banks and seepages, and dry, such as exposed rock. Terrestrial substrates, soil and rock are well represented, with, less frequently, rotten logs and trunks of trees. In spite of this habitat

diversity the total number of 36 species is small compared with lists of mosses prepared for other northern offshore island groups, such as the Hen and Chickens Is 65 species (Cranwell & Moore 1935), Chickens Is 62 species (Beever 1984), Poor Knights Is 59 species (Beever 1986) and Little Barrier I 126 species (Beever unpublished data). Furthermore all species recorded from the Three Kings Is are relatively conspicuous. There is no doubt that further bryological exploration of the Three Kings would reveal a far richer moss flora than is at present recorded.

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